2009

Taunton River Watershed Management Plan Potential Demonstration Projects (May 12, 2009)

Horsley Witten Group, Inc.

Demonstration Projects

Goals:

- "Keep Water Local"
- Restore natural water balance and associated habitats
- Demonstrate technology and techniques locally

6 projects to address:

1. Low Impact Design – recharge water locally
2. Wetland/Habitat Restoration
3. Alternative Wastewater Management – recharge water locally

Plus… water conservation – withdraw less water

What are These Demonstration Projects?

LID Stormwater Retrofits

Habitat Enhancement

Wastewater Management

Water Conservation

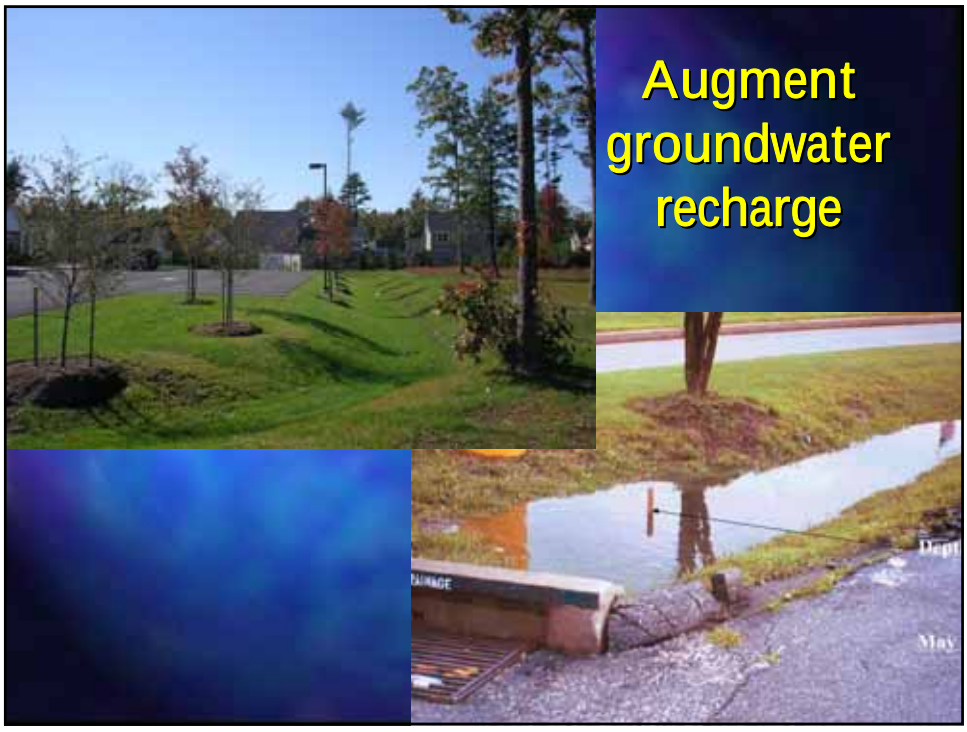
What Are Stormwater Retrofits?

- Stormwater retrofits are stormwater management practices in locations where stormwater controls did not previously exist or were ineffective

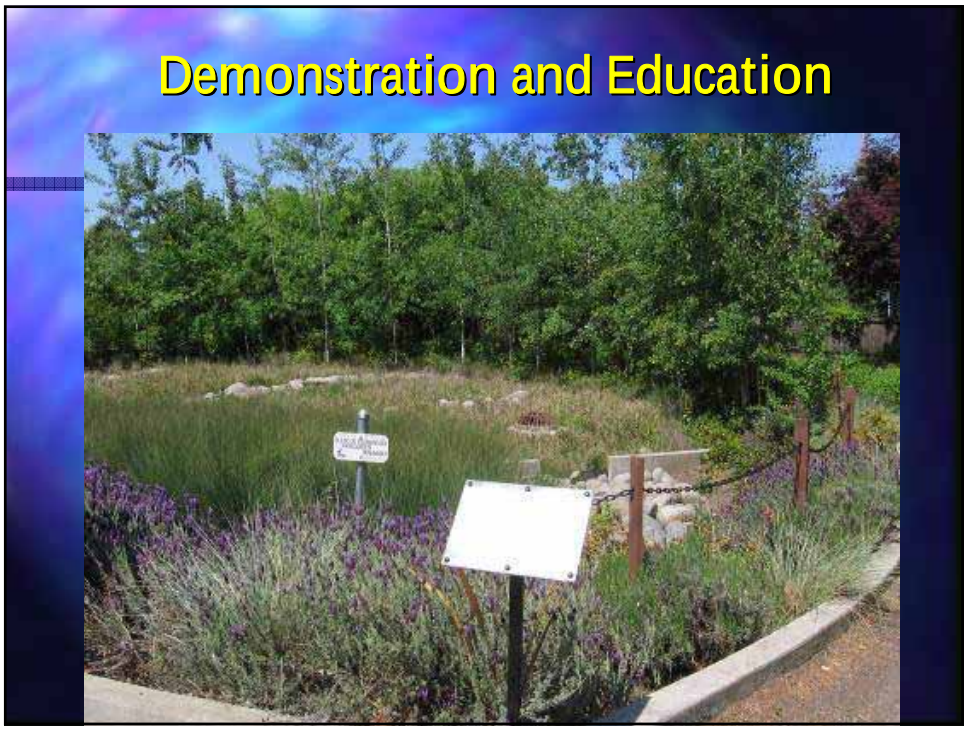

Enhance aquatic habitat &
Restore stream channels


Improve water quality
WARNING!
Combined Sewer Outfall
This outfall pipe may discharge untreated sewage.
Avoid contact with river after rain.
2479
Environmental Services, City of Portland


Reduce flood peaks and volumes


Augment groundwater recharge


Correct past mistakes


Demonstration and Education

Watershed Planning

LID Retrofitting occurs within the context of an overall watershed plan. Other pieces of the puzzle include:

- Stream/Riparian restoration
- Discharge prevention
- Pervious area restoration
- Source control
- Municipal practices
- Education

Typical Locations for Storage Retrofits:

- Existing Stormwater Management Facilities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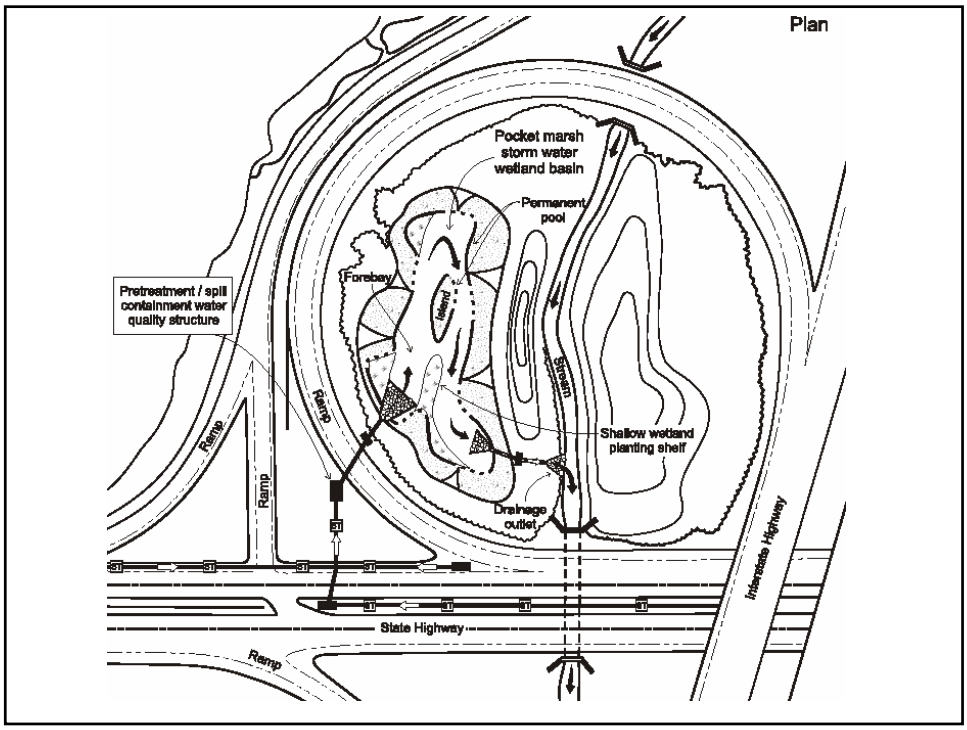
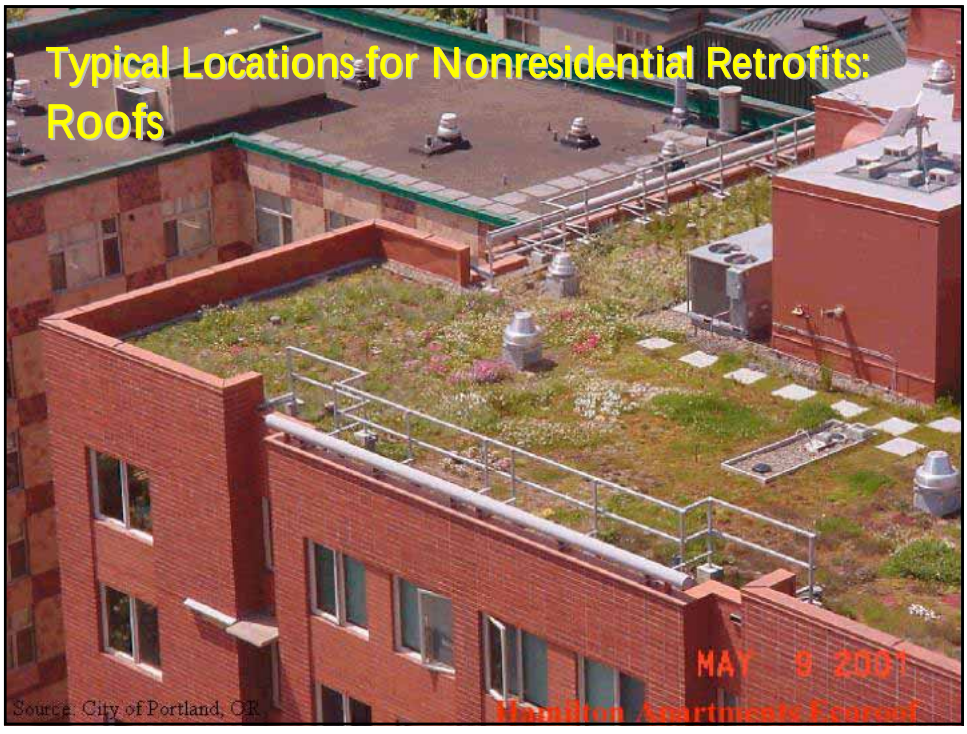

Plan
Pocket marsh storm water wetland basin
Permanent pool
Forebay
Berm
Pretreatment / spill containment water quality structure
Stream
Shallow wetland planting shelf
Drainage outlet
Ramp
Ramp
Ramp
Ramp
Interstate Highway
State Highway


Private parking
lot retrofits…


NE 35th Pl & Siskiyou St.


NE 35th Pl & Siskiyou St.

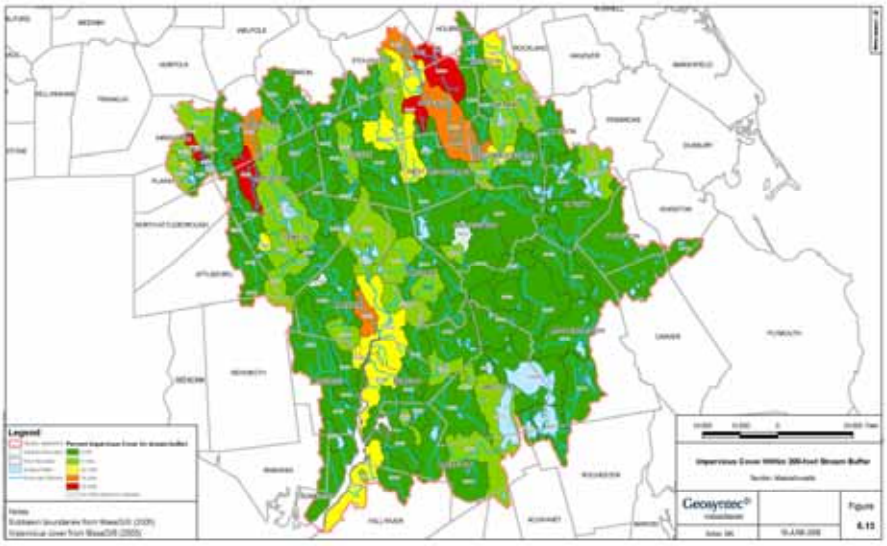

Stormwater Planters


Typical Locations for Nonresidential Retrofits:
Roofs
Source: City of Portland, OR

Subwatershed Factors to Consider in Retrofitting

- Subwatershed IC (current and future)
- Land use and ownership
- Use designation of receiving water
- Presence of existing stormwater management
- Pollutants of concern
- Drinking water supply (volume and quality)
- Small watershed org./HOA presence (onsite)
- Channel erosion and stream restoration goals
- Physiographic features (e.g., steep slopes)
- Climate considerations
- Implementation Funding

% Impervious Cover within Riverfront Area




Root Wad Revetments


Coir Fiber Log

PILOT SCALE WASTEWATER MANAGEMENT

Wastewater Options

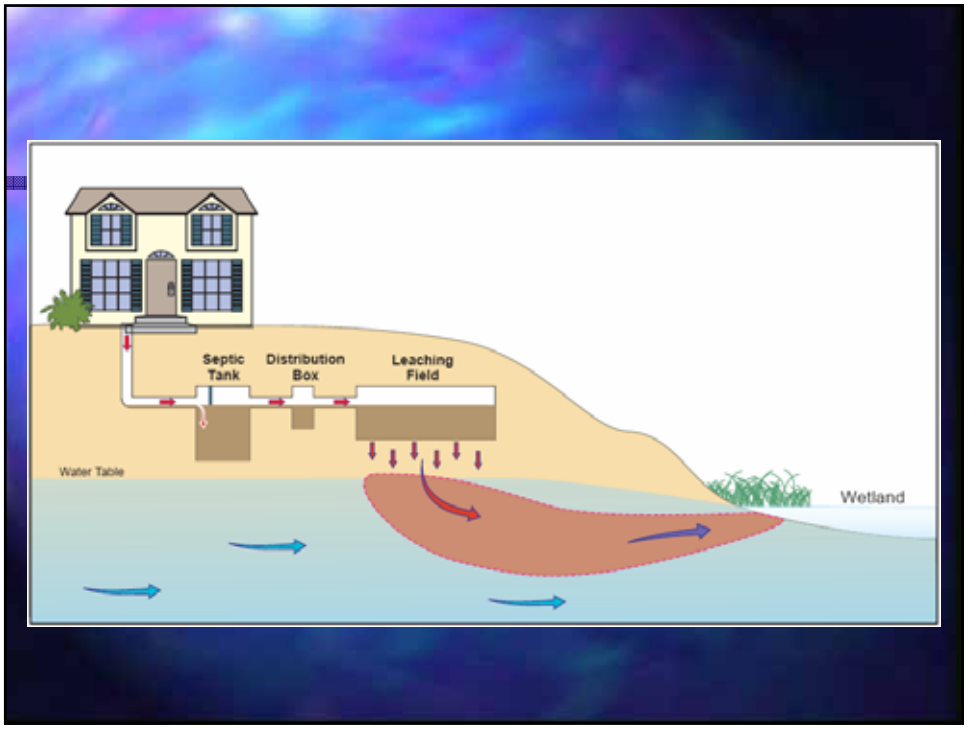
- On-Site Systems
- Cluster/Community Systems
  - Max Flow of 10,000 gpd

Critical Wastewater Disposal Areas

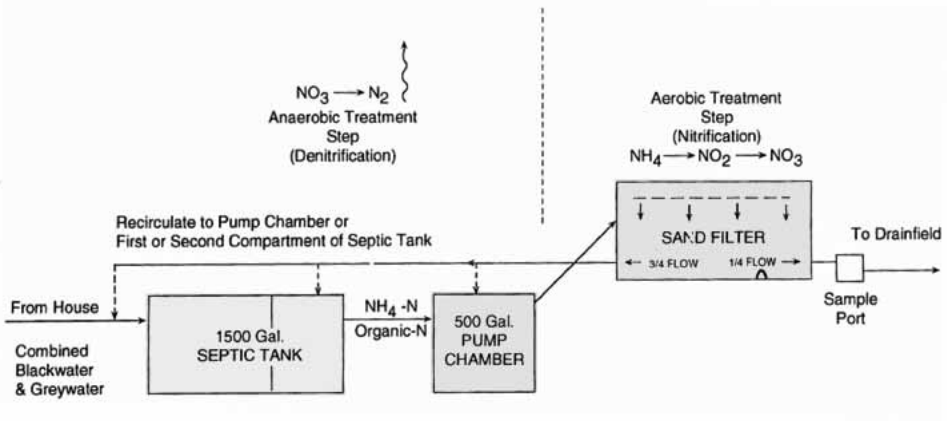
- Water Balance
- High Water Table
- Impermeable Soil or Rock
- Flood Zone
- Protection of Groundwater

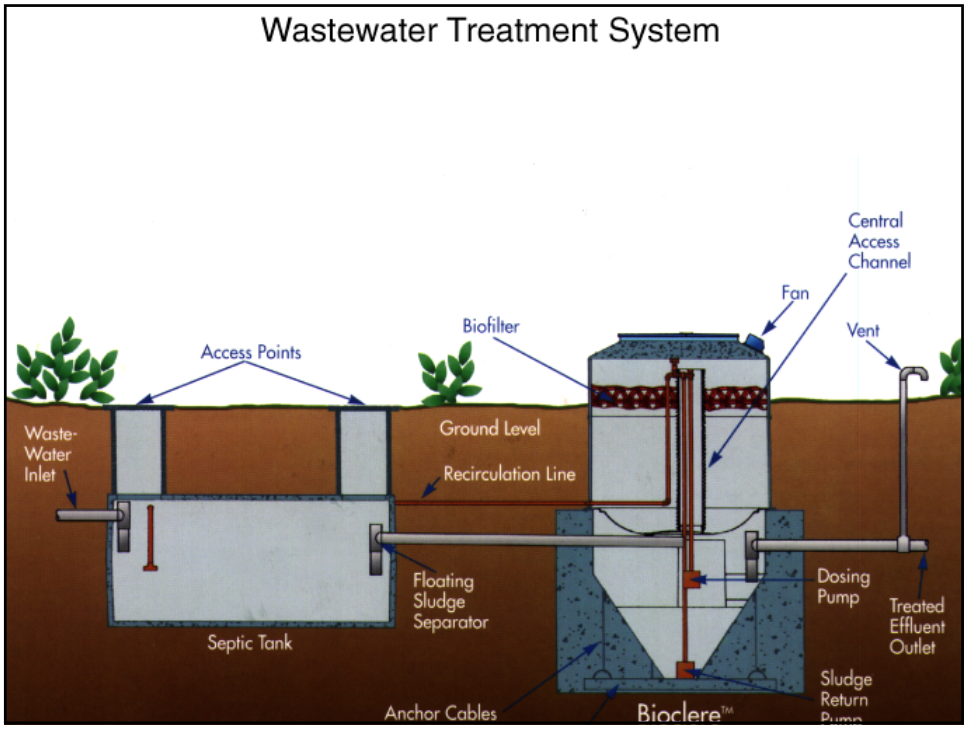
Wastewater Technology Issues

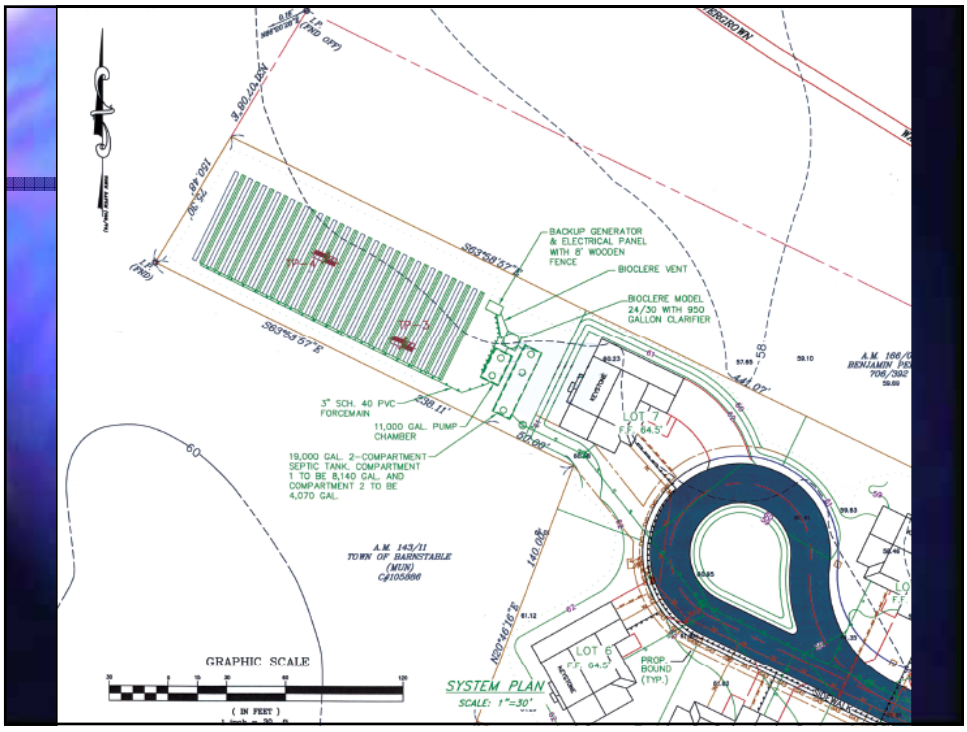
- Collection
  - Gravity vs. Pumped
- Treatment
  - Primary, Secondary, Tertiary
- Disposal
  - Physical constraints



Recirculating Sand Filter System




Wastewater Treatment System
Central Access Channel
Fan
Biofilter
Vent
Access Points
Waste-Water Inlet
Ground Level
Recirculation Line
Floating Sludge Separator
Dosing Pump
Treated Effluent Outlet
Septic Tank
Anchor Cables
Sludge Return
Bioclere™


BACKUP GENERATOR & ELECTRICAL PANEL WITH 8' WOODEN FENCE
BIOCLERE VENT
BIOCLERE MODEL 24/30 WITH 950 GALLON CLARIFIER
3" SCH. 40 PVC FORCEMAIN
11,000 GAL. PUMP CHAMBER
19,000 GAL. 2-COMPARTMENT SEPTIC TANK. COMPARTMENT 1 TO BE 8,140 GAL. AND COMPARTMENT 2 TO BE 4,070 GAL.
LOT 7
F.F. 64.5
LOT 6
F.F. 64.5
PROP. BOUND (TYP.)
A.M. 143/11
TOWN OF BARNSTABLE
(MUN)
GRAPHIC SCALE
(IN FEET)
SYSTEM PLAN
SCALE: 1"=30'


PROPOSED SITE LAYOUT

dcr department of Conservation and Recreation

Demonstration 8

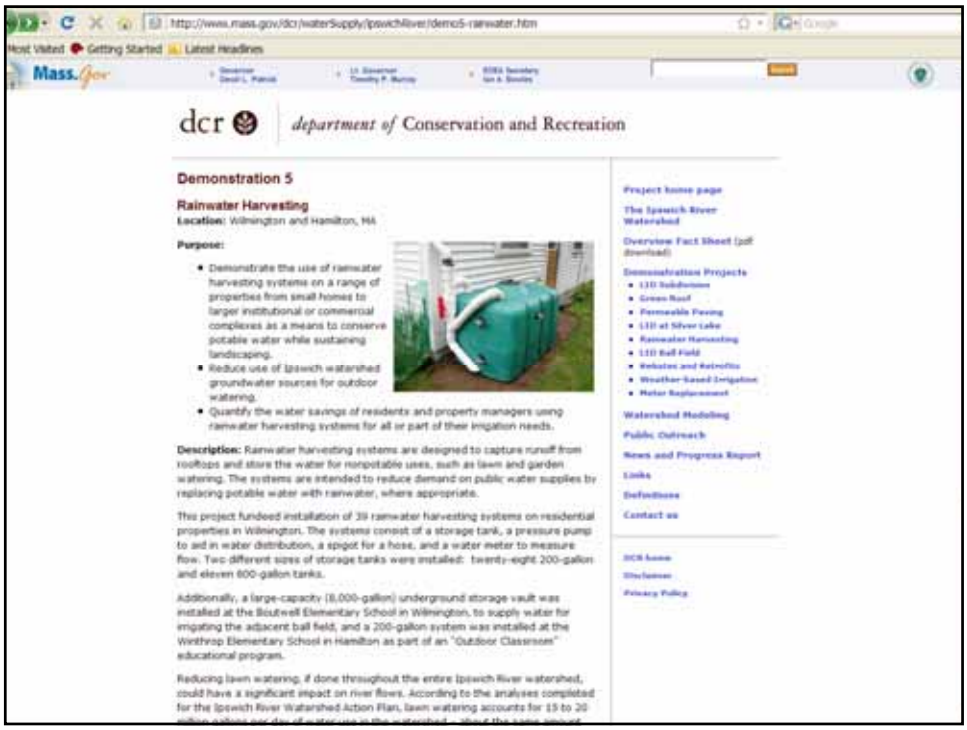
Weather-Based Irrigation Controllers

Locations: Hamilton, Middleton, Peabody, North Reading, Reading

Purpose:

- Demonstrate the use of innovative irrigation technology as a means to reduce water use for outdoor landscaping, while maintaining healthy landscapes.
- Reduce overall water demand on public water supplies.
- Quantify the water savings associated with use of innovative irrigation controller switches to deliver water only when needed.

Description: A total of 23 weather-based irrigation controller switches were installed on both residential properties and municipal athletic fields in five communities. These devices contain an on-site rain gage and receive continuously transmitted wireless data on solar radiation, temperature, relative humidity, and wind. Based on this information, the device delivers the optimum amount of water only when needed by the landscape. Fifteen residential properties in Reading and 10 municipal athletic fields in Hamilton, Middleton, Peabody, North Reading,



dcr department of Conservation and Recreation

Demonstration 5

Rainwater Harvesting

Location: Wilmington and Hamilton, MA

Purpose:

- Demonstrate the use of rainwater harvesting systems on a range of properties from small homes to larger institutional or commercial complexes as a means to conserve potable water while sustaining landscaping.
- Reduce use of Ipswich watershed groundwater sources for outdoor watering.
- Quantify the water savings of residents and property managers using rainwater harvesting systems for all or part of their irrigation needs.

Description: Rainwater harvesting systems are designed to capture runoff from rooftops and store the water for nonpotable uses, such as lawn and garden watering. The systems are intended to reduce demand on public water supplies by replacing potable water with rainwater, where appropriate.

This project funded installation of 39 rainwater harvesting systems on residential properties in Wilmington. The systems consist of a storage tank, a pressure pump to aid in water distribution, a spigot for a hose, and a water meter to measure flow. Two different sizes of storage tanks were installed: twenty-eight 200-gallon and eleven 600-gallon tanks.

Additionally, a large-capacity (8,000-gallon) underground storage vault was installed at the Boutwell Elementary School in Wilmington, to supply water for irrigating the adjacent ball field, and a 200-gallon system was installed at the Winthrop Elementary School in Hamilton as part of an "Outdoor Classroom" educational program.

Reducing lawn watering, if done throughout the entire Ipswich River watershed, could have a significant impact on river flows. According to the analyses completed for the Ipswich River Watershed Action Plan, lawn watering accounts for 15 to 20